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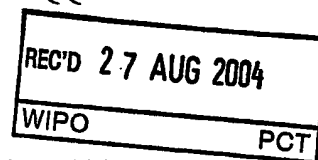
I, the undersigned, being an officer duly authorised in accordance with Section 74(1) and (4) of the Deregulation & Contracting Out Act 1994, to sign and issue certificates on behalf of the Comptroller-General, hereby certify that annexed hereto is a true copy of the documents as originally filed in connection with the patent application identified therein.

I also certify that the attached copy of the request for grant of a Patent (Form 1/77) bears an amendment, effected by this office, following a request by the applicant and agreed to by the Comptroller-General.

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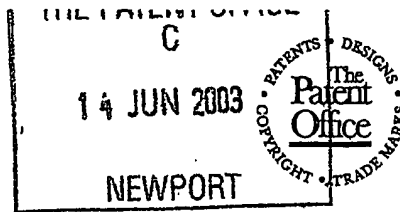
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Dated   19 August 2004

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Patents Form 1/77

Patents Act 1977
Rule 16

1/77

16JUN03 E815106-1 C81669
P01/7700 0.00-0313800.5

Request for grant of a patent

(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)

The Patent Office

Cardiff Road
Newport
South Wales
NP10 8QQ

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1. Your reference

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2. Patent application number
(The Patent Office will fill in this part)

0313800.5

1 4 JUN 20

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3. Full name, address and postcode of the or of each applicant *(underline all surnames)*

ANWAR BASHIR
3 BRANKLYN GARDENS
INGLEBY BARWICK
STOCKTON-ON-TEES. TS17 0NA.
8317950001

Patents ADP number *(if you know it)*

If the applicant is a corporate body, give the country/state of its incorporation

---

4. Title of the invention

IMPROVED ACCESS, INFORMATION AND CONTROL OF EQUIPMENT AND FACILITIES

---

5. Name of your agent *(if you have one)*

"Address for service" in the United Kingdom to which all correspondence should be sent *(including the postcode)*

Dominic Elsworth
Hargreaves Elsworth
Rotterdam House
116 Quayside
Newcastle-Upon-Tyne
NE1 3DY.   See f51/77

Patents ADP number *(if you know it)*

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6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and *(if you know it)* the or each application number

Country	Priority application number *(if you know it)*	Date of filing *(day / month / year)*
		Filed 19.5.0

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7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application	Date of filing *(day / month / year)*

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8. Is a statement of inventorship and of right to grant of a patent required in support of this request? *(Answer 'Yes' if:*
   a) *any applicant named in part 3 is not an inventor, or*
   b) *there is an inventor who is not named as an applicant, or*
   c) *any named applicant is a corporate body.*
   See note (d))

Patents Form 1/77

Patents Form 1/77

9. Enter the number of sheets for any of the
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Continuation sheets of this form	6
Description	
Claim(s)	
Abstract	
Drawing(s)	2 × 2 ful

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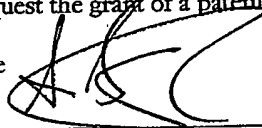|	
Priority documents	NO
Translations of priority documents	NO
Statement of inventorship and right to grant of a patent (Patents Form 7/77)	NO
Request for preliminary examination and search (Patents Form 9/77)	NO
Request for substantive examination (Patents Form 10/77)	NO
Any other documents (please specify)	NO.

11.

I/We request the grant of a patent on the basis of this application.

Signature _[signature]_   Date 13/06/03

12. Name and daytime telephone number of
    person to contact in the United Kingdom

ANWAR BASHIR   01642 769203

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Notes

a) If you need help to fill in this form or you have any questions, please contact the Patent Office on 08459 500505.

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Improved Access, Information and Control of Equipment and Facilities

This invention relates to a system for controlling access to control equipment and facilities and providing management information on the use of those facilities using a new and novel variation on the commonly used Hypertext Mark-up Language (HTML).

A typical control system in a modern office environment consists of a variety of independent hardware and software elements often linked to management information systems by bespoke means.

A medium sized business environment will contain photocopiers, printers, door access control, car parking control, fire alarm system, and temperature control system. These would communicate with by means of various communication links such as Local Area Networks (LAN), Analogue Cabling, Serial Lines, Fieldbuses, or even Satellite Communications. This mix of devices and communications will be supported by discrete programming methods that are not the same across the entire enterprise. This is not only inconvenient for both staff and management but it is also expensive and inefficient.

The problem has been recognised by others and efforts are being made to address the issues by adopting common communication standards.

A software system known as CORBA (Common Open Request Broker Architecture) has been developed. This suggests a simple approach but in fact it requires sophisticated programming to achieve the desired result of a simple common system for users of office equipment and facilities.

Another system known as COBA (Connected Open Building Automation) is a standardisation effort initiated by a consortium of 15 companies in the construction, building, automation, telecommunications and information technology industries. This suggests an open standard for easy and secure access to buildings but to date it has not led to manufacturers sharing a single universal standard.

Neither approach has resulted in a simple universal programming language that offers a standard connectivity for all common office equipment and services.

Generally the control system industry continues to develop products for specific markets (e.g. home, buildings, office equipment etc.) and each market sector develops relatively complex systems that are difficult to adapt across market boundaries. A technology that is simple to use and enables seamless cross market development would clearly reduce business costs and create new market structures.

The flow of information across computer networks has largely been standardised by the almost universal adoption of HTML (Hypertext Markup Language). Whereas HTML is a standard programming language that has been almost universally adopted for the transmission of on-screen information, the actual control of physical devices has not been accomplished by a similar universal programming standard. The methods used are often peculiar to one particular type of physical device; for instance, the program that controls a security door would be different from that used to allow usage of a photocopier.

It could be argued that the growth of the World Wide Web on the Internet could be traced back to the invention of HTML. HTML suffers from a lack of one feature that is important to programmers, it is stateless (i.e. information is not retained). In order to retain information HTML programmers have developed additional tools such as, CGI (Common Gateway Interface) scripts, ASP (Active Server Pages), JSP (Java Server Pages) and PHP (Hypertext Preprocessor). These server side technologies allow designers to create applications which are dynamically generated. Often database-driven, these advanced sites can be updated and maintained more readily than static HTML pages.

Similarly, known technologies provide a readily available infrastructure which could be utilised to provide control systems which are far easier to develop and maintain. The precise nature and mixture of products is a matter of choice. The transport and delivery mechanisms which led to the rapid expansion of the Internet require only minimal adaptation to become applicable to control systems. The essential elements consist of a web-server and a database and a database connectivity tool.

There are a plethora of products which can establish such an environment, a common open source system is a Linux server, running an Apache web-server, a MySQL database and a PHP service. This configuration is becoming known under the generic term of LAMP (Linux, Apache, MySQL and PHP). The provision for additional technologies to format and extend functionality such as Extended Markup Language (XML) and the Simple Object Management Protocol (SOAP), promoted in some texts, creates complexity that is counter productive to the aim of providing a simple standard that could be used by casual programmers.

According to the present invention there is provided a control system for physical devices such as door locks based on a simple extension to the commonly used Hypertext Mark-up Language known as HTML, which has been almost universally adopted for transmission of standard web page requests. The variation will be referred to as bang HTML or !HTML (the exclamation mark prefix is sometimes referred to as "bang" by computer programmers).

HTML is not only well known but is also easy to learn and very simple to use. It does not require a specialist in information technology with a high level of knowledge and experience to use it. The extension referred to as !HTML has the same general attributes enableing non-specialists to use it to adapt to changing requirements for management control and information systems in the office.

!HTML eliminates the need to use bespoke programming systems across a computer network to enable the operation and control of physical devices such as photocopiers and entrance systems to buildings. By using !HTML it is possible to control all devices on any network using one simple universal programming language.

!HTML speeds up network traffic compared with other systems because it significantly reduces the complexity of network requests.

The adoption of !HTML will permit purchasers of new office equipment to select any combination of hardware within the office because !HTML can be used to communicate with all hardware. Also it can be used to communicate with existing hardware and it is not necessary to re-equip an office when !HTML is introduced.

!HTML will allow control systems to be driven from web pages that contain control information in a simple tabulated format.

!HTML will allow Web Page Graphical Objects to be collected as a library of control function elements. For instance, an icon of a closed door when clicked on screen will open a particular access door and the image will change to an open door icon, or vice versa.

!HTML will allow a single technology to be shared, developed and used for control application across vendor boundaries.

!HTML will allow on-screen application error checking for development prior to commitment to microcontroller programs.

A specific example of the invention will now be described by way of example with reference to the accompanying drawings in which Figure 1 shows a typical office environment and how it can be controlled and monitored.

Figure 2 is a flow diagram illustrating the operation of the system in general terms using the example of an authorised person gaining access to a security door.

In Figure 1 it can be seen that when a person (not shown) requires entry through a security access door 1 for example he identifies himself by inserting an identity card (not shown) into the swipe card reader 2. The swipe card reader 2 interfaces with a microcontroller program 3. The card data (not shown) is received by the microcontroller program 3. The user identity (not shown) which is contained within the card data (not shown) is sent by means of a network request 4 to the server 5. A server program 6 inspects the database 7 for matching information. If the user identity (not shown) is valid the person's actual name is returned with table data markers 8 to the microcontroller program 3 via the server 5.

The door 1 could be any control requirement and examples in an office environment might include a photocopier, a car park barrier, fire alarm system, temperature control system, printer etc. The lock 9 which controls access via door 1 might be any form of actuator like a solenoid or microswitch for example.

The client management information system 10 permits a manager (not shown) to communicate with the database 7 via a reporting interface (not shown).

Normally the microcontroller program 3 is vendor specific but in the present invention this is replaced by a !HTML parser. This inspects web based information placed between table markers (not shown) and performs some operation depending on the nature and context of this information. This means that no special data manipulation programming is required. It also means that the data could be driven from information held in tables from applications such as spreadsheets.

The network request code 4 is normally vendor specific but in the present invention it is replaced by a standard internet request. This replaces the plethora of complex network request methodologies currently available.

The server 5 normally uses software which is vendor specific but in the present invention is replaced by a database driven server achitechture. This enables servers to be configured and used for control requirements by a far larger community of people who have less specific programmer knowledge.

The database 7 normally uses software which is vendor specific but in the present invention allows development using simple, affordable databases and provides customer greater flexibility and choice.

The control data could be returned to the microcontroller program 3 as simple text, but in !HTML the relevant data is formatted between table markers to make it easier for the microcontroller program 3 to locate relevant data.

This strategy enables separation of implementation from interfaces, for instance it is not necessary to know how to program a computer port directly or understand the protocols used. The interfaces (not shown) can be packaged in terms of objects (not shown) and made known to the microcontroller program 3, i.e. expressing the request in a higher level form of language (e.g. open port A, close port B – not shown).

This presents casual and dedicated developers alike with the relatively simple task of creating a web-page (not shown) that appears to be automatically read by a microcontroller which is used to designate some control requirement like a security access door.

Figure 2 is a flow diagram which illustrates the operation of the system in general terms using the example of an authorised person gaining access to a security door. Many other devices could be controlled using this technique of embedding specific information between table markers. By using !HTML it is possible to control all devices on any network using one simple universal programming language as opposed to vendor specific software.
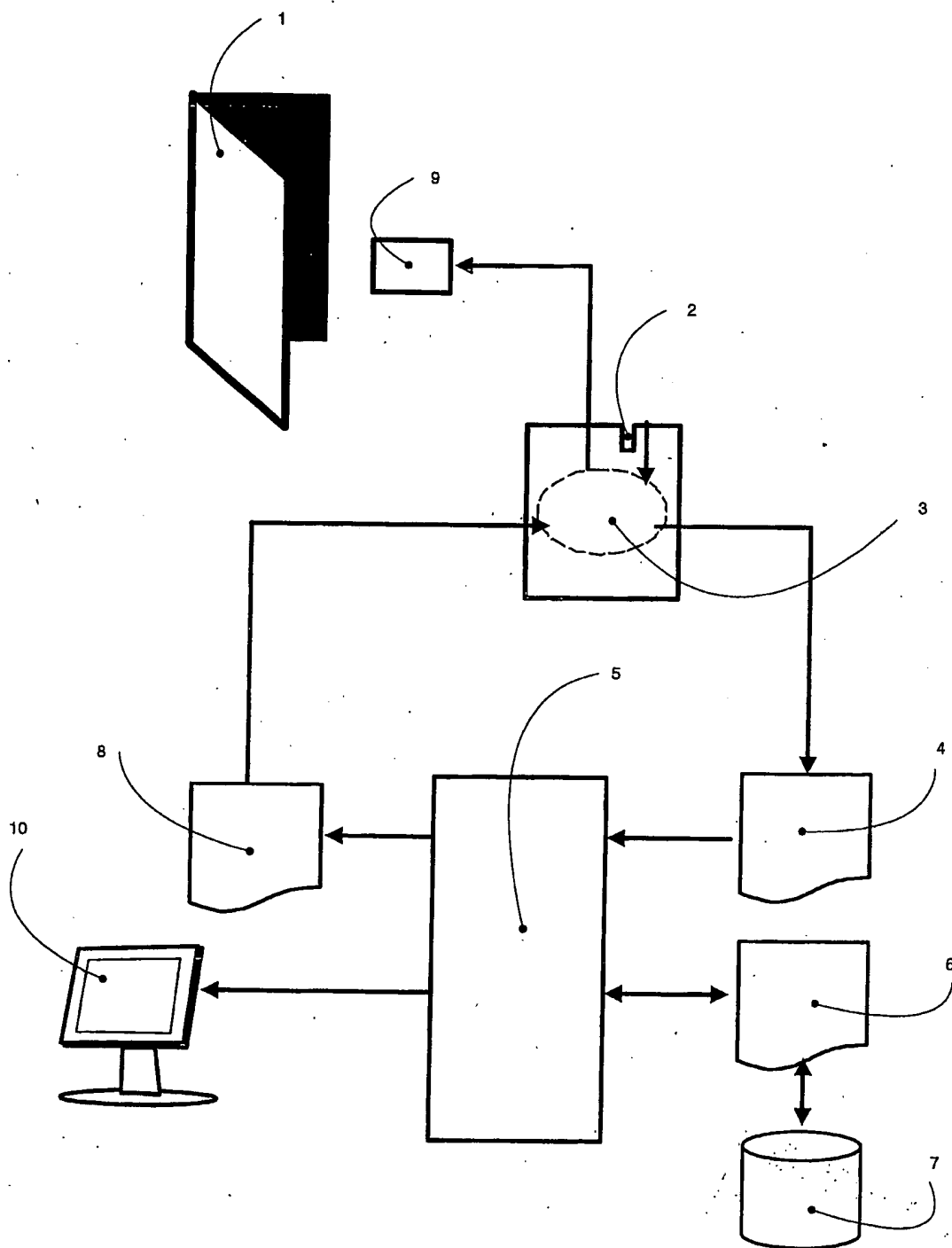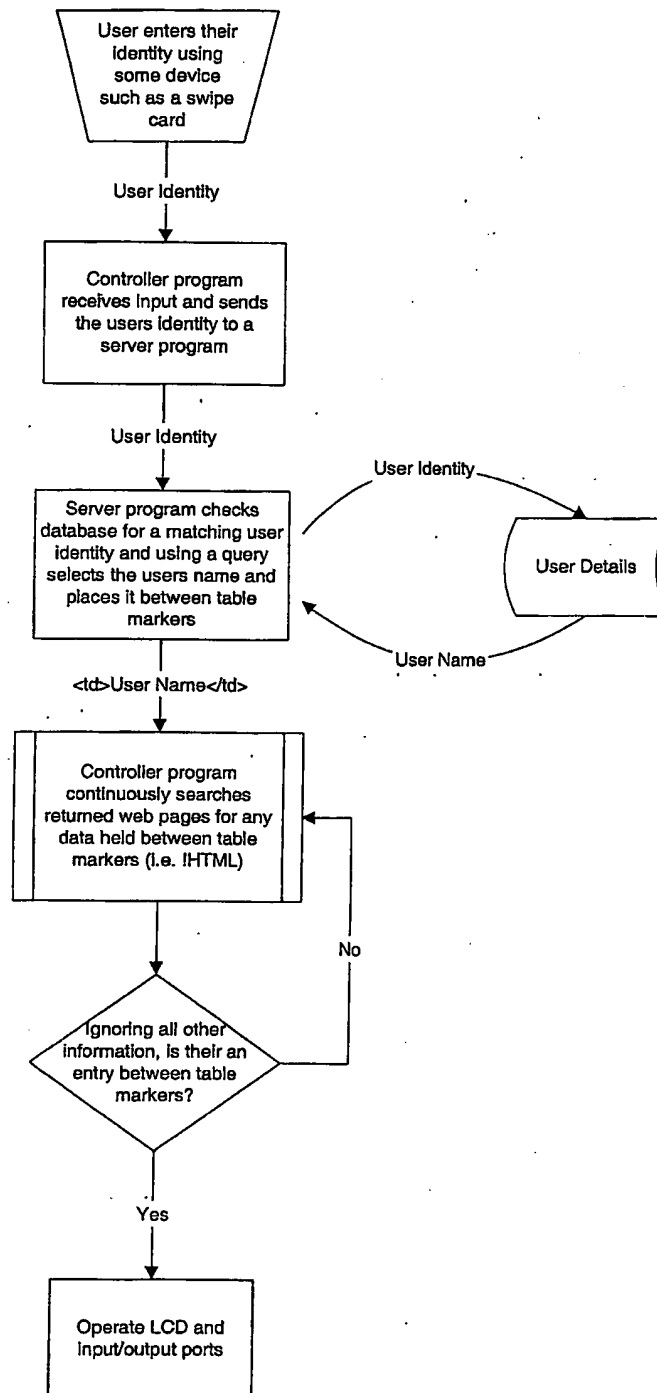
Figure 1

```
             ┌─────────────────┐
            /  User enters their \
           /     identity using   \
          /     some device        \
          \    such as a swipe      /
           \         card         /
            └─────────────────────┘
                     │
                User Identity
                     │
                     ▼
          ┌─────────────────────┐
          │  Controller program  │
          │ receives input and   │
          │ sends the users      │
          │ identity to a        │
          │ server program       │
          └─────────────────────┘
                     │
                User Identity
                     │                    User Identity
                     ▼                   ─────────────►
          ┌─────────────────────┐                      ┌──────────────┐
          │  Server program      │                      │              │
          │  checks database for │                      │ User Details │
          │  a matching user     │                      │              │
          │  identity and using  │                      └──────────────┘
          │  a query selects the │
          │  users name and      │        ◄───── User Name
          │  places it between   │
          │  table markers       │
          └─────────────────────┘
                     │
           <td>User Name</td>
                     │
                     ▼
          ║┌─────────────────────┐║
          ║│  Controller program  │║
          ║│ continuously searches│║◄──────────────┐
          ║│ returned web pages   │║                │
          ║│ for any data held    │║                │
          ║│ between table        │║                │
          ║│ markers (i.e. !HTML) │║                │
          ║└─────────────────────┘║                │
                     │                              │ No
                     ▼                              │
                  ╱──────╲                          │
                ╱ Ignoring ╲                        │
               ╱ all other   ╲───────────────────────┘
               ╲ information,  ╱
                ╲is their an  ╱
                 ╲entry between╱
                  ╲table      ╱
                   ╲markers? ╱
                     ╲────╱
                       │
                      Yes
                       │
                       ▼
            ┌─────────────────────┐
            │  Operate LCD and     │
            │  input/output ports  │
            └─────────────────────┘
```

Figure 2